

CLAIMS

1. An apparatus for a communication system, comprising:
 - a decoder element for decoding a plurality of received samples to provide decoded half-symbols, wherein the decoder element is configured to perform decoding with a decoding channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples; and
 - a first multiplier for receiving the decoded half-symbols and pilot symbols to provide demodulated half-symbols.
2. The apparatus of claim 1, wherein the received samples are despread received samples, further comprising:
 - a second multiplier for producing the despread received samples.
3. The apparatus of claim 1, further comprising:
 - a combiner for combining the demodulated half-symbols received from the first multiplier.
4. The apparatus of claim 3, wherein the combiner comprises:
 - a first accumulator for accumulating the demodulated half-symbols corresponding to a first half of a symbol period; and
 - a second accumulator for accumulating the demodulated half-symbols corresponding to a second half of the symbol period.
5. The apparatus of claim 1, further comprising:
 - a switch for selectively outputting the demodulated half-symbols corresponding to a first half of the symbol period and the demodulated half-symbols corresponding to a second half of the symbol period.
6. An apparatus for a communication system, comprising:
 - a first and second correlator, each correlator including
 - a decoder element for decoding a plurality of received samples to provide decoded half-symbols, wherein the decoder element is configured to

perform discovering with a discovering channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples;

a first multiplier for receiving the discovered half-symbols and pilot symbols to provide demodulated half-symbols; and

a switch for selectively sending a demodulated half-symbol along a first signal path during a first half of a symbol period and an inverted demodulated half-symbol along a second signal path during a second half of the symbol period.

7. The apparatus of claim 6, wherein the received samples are despread samples, and further comprising:

a second multiplier for producing the despread received samples.

8. The apparatus of claim 6, further comprising:

a conjugator for conjugating the demodulated half-symbols along the second signal path.

9. The apparatus of claim 6, further comprising:

a combiner for combining the demodulated half-symbols received from the first and second signal paths of the respective first and second correlators.

10. The apparatus of claim 9, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols along the first signal path of the first correlator and the second signal path of the second correlator; and

a second accumulator for accumulating the demodulated half-symbols along the second signal path of the first correlator and the first signal path of the second correlator.

11. An apparatus for a communication system, comprising:

a first and second correlator, each correlator including

a discover element for discovering a plurality of received samples to provide discovered half-symbols, wherein the discover element is configured to perform discovering with a discovering channelization symbol having a length

(T) that is half the length ($2T$) of a covering channelization symbol used to cover the received samples;

a switch for selectively outputting the discovered half-symbols corresponding to a first half of a symbol period along a first signal path and discovered half-symbols corresponding to a second half of the symbol period along a second signal path;

first and second summers, respectively coupled to the first and second signal paths, for combining each pair of discovered half-symbols to provide a respective discovered symbol; and

first and second multipliers for receiving the discovered symbols and pilot symbols to provide demodulated symbols.

12. The apparatus of claim 11, wherein the received samples are despread received samples, said first and second correlator further including:

a third multiplier for producing the despread received samples.

13. The apparatus of claim 11, further comprising:

a conjugator for conjugating the discovered symbols along the second signal path of the first correlator and the first signal path of the second correlator.

14. The apparatus of claim 11, further comprising:

a delay element for delaying the discovered half-symbols along the first signal path.

15. The apparatus of claim 14, further comprising:

a combiner for combining the demodulated symbols received from the first and second correlators.

16. The apparatus of claim 15, wherein the combiner comprises:

a first accumulator for accumulating the demodulated symbols from the first multiplier of the first and second correlators; and

a second accumulator for accumulating the demodulated symbols from the second multiplier of the first and second correlators.

17. A communication system, comprising:
a transmitter; and
a receiver for processing a received signal transmitted from the transmitter, said receiver including:

a decoder element for decoding a plurality of received samples to provide decoded half-symbols, wherein the decoder element is configured to perform decoding with a decoding channelization symbol having a length (T) that is half the length (2T) of a covering channelization symbol used to cover the received samples; and

a first multiplier for receiving the decoded half-symbols and pilot symbols to provide demodulated half-symbols.

18. The communication system of claim 17, wherein the received samples are despread received samples, further comprising:

a second multiplier for producing the despread received samples.

19. The communication system of claim 17, further comprising:

a combiner for combining the demodulated half-symbols received from the first multiplier.

20. The communication system of claim 19, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols corresponding to a first half of a symbol period; and

a second accumulator for accumulating the demodulated half-symbols corresponding to a second half of the symbol period.

21. The communication system of claim 17, further comprising:

a switch for selectively outputting the demodulated half-symbols corresponding to a first half of the symbol period and the demodulated half-symbols corresponding to a second half of the symbol period.

22. A communication system, comprising:

a transmitter; and

a receiver for processing a received signal transmitted from the transmitter, said receiver including:

a first and second correlator, each correlator including

a decoder element for discovering a plurality of received samples to provide discovered half-symbols, wherein the decoder element is configured to perform discovering with a discovering channelization symbol having a length (T) that is half the length ($2T$) of a covering channelization symbol used to cover the received samples;

a first multiplier for receiving the discovered half-symbols and pilot symbols to provide demodulated half-symbols; and

a switch for selectively sending a demodulated half-symbol along a first signal path during a first half of a symbol period and an inverted demodulated half-symbol along a second signal path during a second half of the symbol period.

23. The communication system of claim 22, wherein the received samples are despread samples, and further comprising:

a second multiplier for producing the despread received samples.

24. The communication system of claim 22, further comprising:

a conjugator for conjugating the demodulated half-symbols along the second signal path.

25. The communication system of claim 22, further comprising:

a combiner for combining the demodulated half-symbols received from the first and second signal paths of the respective first and second correlators.

26. The communication system of claim 25, wherein the combiner comprises:

a first accumulator for accumulating the demodulated half-symbols along the first signal path of the first correlator and the second signal path of the second correlator; and

a second accumulator for accumulating the demodulated half-symbols along the second signal path of the first correlator and the first signal path of the second correlator.

27. A communication system, comprising:

a transmitter; and

a receiver for processing a received signal transmitted from the transmitter, said receiver including:

- a first and second correlator, each correlator including

- a decoder element for decoding a plurality of received samples to provide decoded half-symbols, wherein the decoder element is configured to perform decoding with a decoding channelization symbol having a length (T) that is half the length ($2T$) of a covering channelization symbol used to cover the received samples;

- a switch for selectively outputting the decoded half-symbols corresponding to a first half of a symbol period along a first signal path and decoded half-symbols corresponding to a second half of the symbol period along a second signal path;

- first and second summers, respectively coupled to the first and second signal paths, for combining each pair of decoded half-symbols to provide a respective decoded symbol; and

- first and second multipliers for receiving the decoded symbols and pilot symbols to provide demodulated symbols.

28. The communication system of claim 27, wherein the received samples are despread received samples, said first and second correlator further including:

- a third multiplier for producing the despread received samples.

29. The communication system of claim 27, further comprising:

- a conjugator for conjugating the decoded symbols along the second signal path of the first correlator and the first signal path of the second correlator.

30. The communication system of claim 27, further comprising:

- a delay element for delaying the decoded half-symbols along the first signal path.

31. The communication system of claim 27, further comprising:

- a combiner for combining the demodulated symbols received from the first and second correlators.

32. The communication system of claim 31, wherein the combiner comprises:
a first accumulator for accumulating the demodulated symbols from the first multiplier of the first and second correlators; and

a second accumulator for accumulating the demodulated symbols from the second multiplier of the first and second correlators.

33. A method for processing a received signal in a wireless communication system, comprising:

discovering a plurality of received samples to provide discovered half-symbols, wherein the discovering is performed with a discovering channelization symbol having a length (T) that is half the length ($2T$) of a covering channelization symbol used to cover the received samples; and

receiving the discovered half-symbols and pilot symbols to provide demodulated half-symbols by a multiplier.

34. The method of claim 33, further comprising:
despreading the received samples.

35. The method of claim 33, further comprising:
combining the demodulated half-symbols received from the multiplier.

36. The method of claim 35, wherein said combining further comprises:
accumulating the demodulated half-symbols corresponding to a first half of a symbol period in a first accumulator; and

accumulating the demodulated half-symbols corresponding to a second half of the symbol period in a second accumulator.

37. The method of claim 33, further comprising:
selectively outputting the demodulated half-symbols corresponding to a first half of the symbol period and the demodulated half-symbols corresponding to a second half of the symbol period.